

# Western Sydney Green Gas Trial Project Update and Application for Future Renewable Natural Gas

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# Acknowledgement and Disclaimer

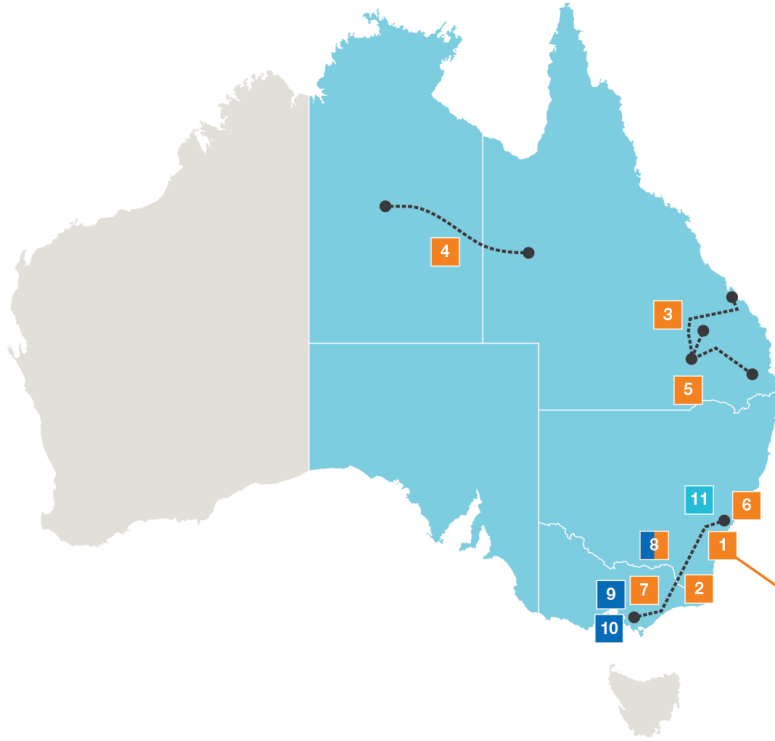
## Acknowledgement:

- This project received funding from ARENA as part of ARENA's *Advancing Renewables Program*

## Disclaimer:

- “The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.”

# About Jemena



## Gas

- 1 Jemena Gas Network
- 2 Eastern Gas Pipeline
- 3 Queensland Gas Pipeline
- 4 Northern Gas Pipeline (under construction)
- 5 Darling Downs Pipelines
- 6 Colongra Gas Transmission and Storage Pipeline
- 7 VicHub
- 8 Evoenergy Distribution Partnership (50%)

TRANSMISSION PIPELINE

## Electricity

- 9 Jemena Electricity Network
- 10 United Energy Distribution (34%)

## Water

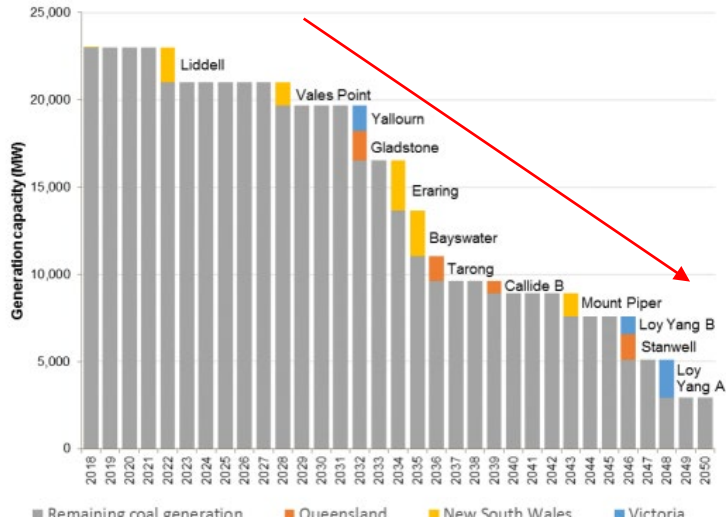
- 11 Rosehill Recycled Water



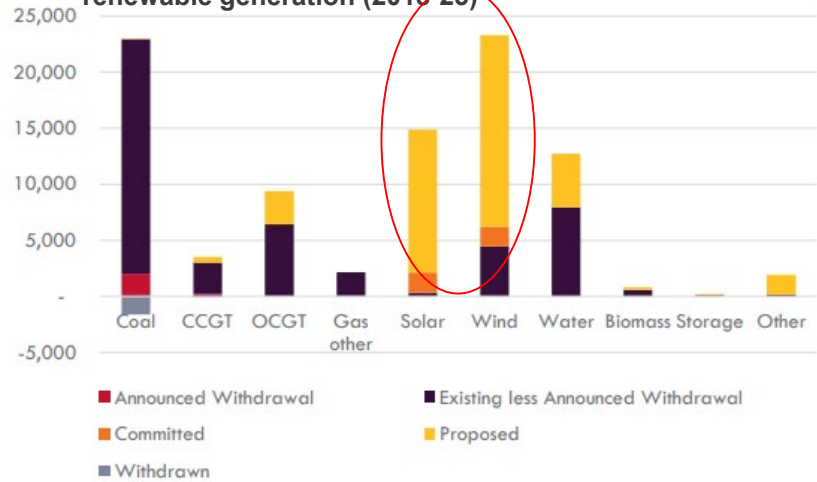
Country Hunter Illawara Sydney North Sydney South

# Changing East Coast Energy Market

Proposed retirement of aging coal baseload



Decarbonisation and increasing investment in intermittent renewable generation (2018-25)

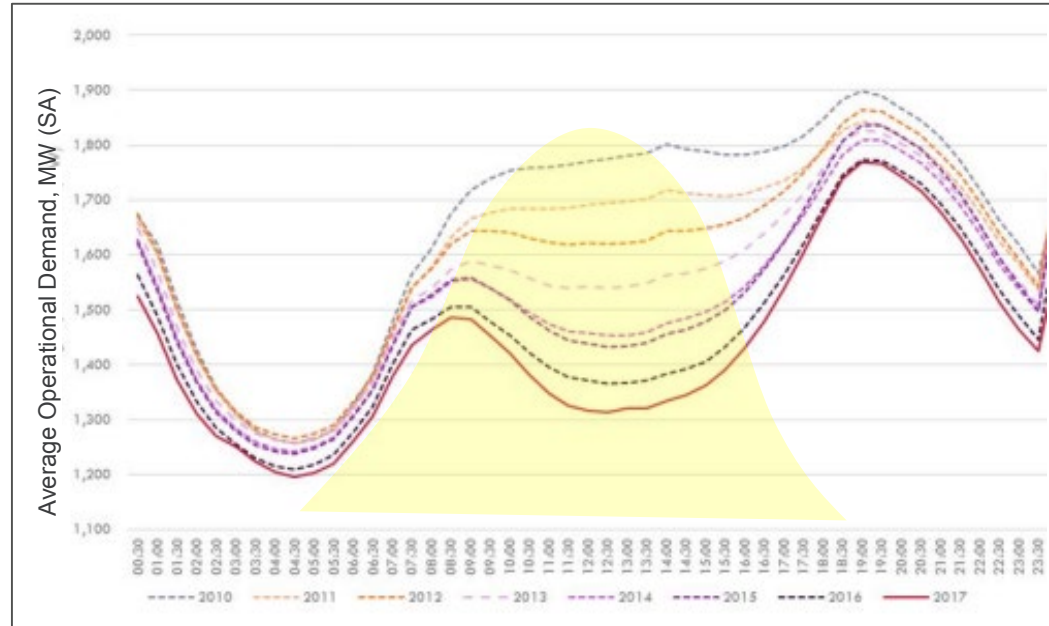


Significant reduction in dispatchable generation and increasing variable renewable electricity (VRE)

# Changing East Coast Energy Market

- The installation of high levels of embedded solar PV generation across the NEM is leading to reduction in operational demand during peak solar generation
- Potential for intermittent generation to be curtailed providing a constraint or disincentive for future investment in renewable energy

The effects of growing rooftop solar – emergence of the “duck curve”



Source: AEMO Observations, March 2018

# Hydrogen



Most common substance  
in the universe



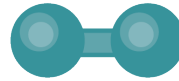
No greenhouse  
emissions



Produced from many  
energy sources



Can be made  
cleanly using water



Higher energy density than  
batteries when compressed



Can be stored  
as a liquid or gas



Can be stored,  
transported & exported



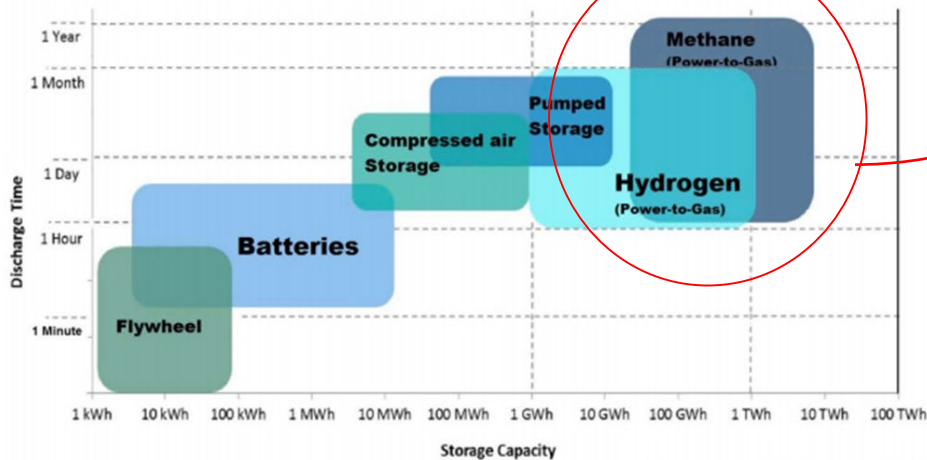
No more or less safe than  
petrol or diesel fuels



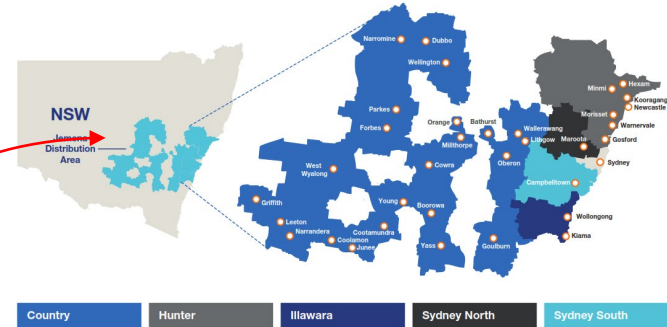
Can provide energy to  
all parts of the economy

# Role of Gas Distribution Network

Available Storage Technologies, Their Capacities and Discharge Time



Source: School of Engineering, RMIT University (2015)

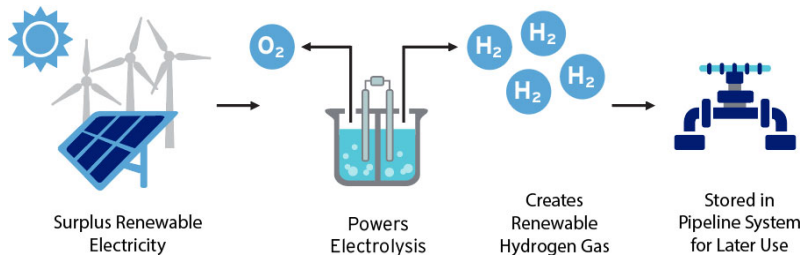


## Existing Infrastructure:

- \$4bn asset
- >25,000kms of buried pipelines
- connected to over 1.4m customers

## Storage

- Intraday and seasonal storage (~8 million power walls)
- Distributed and responsive



# Project Overview and Update

## Schedule

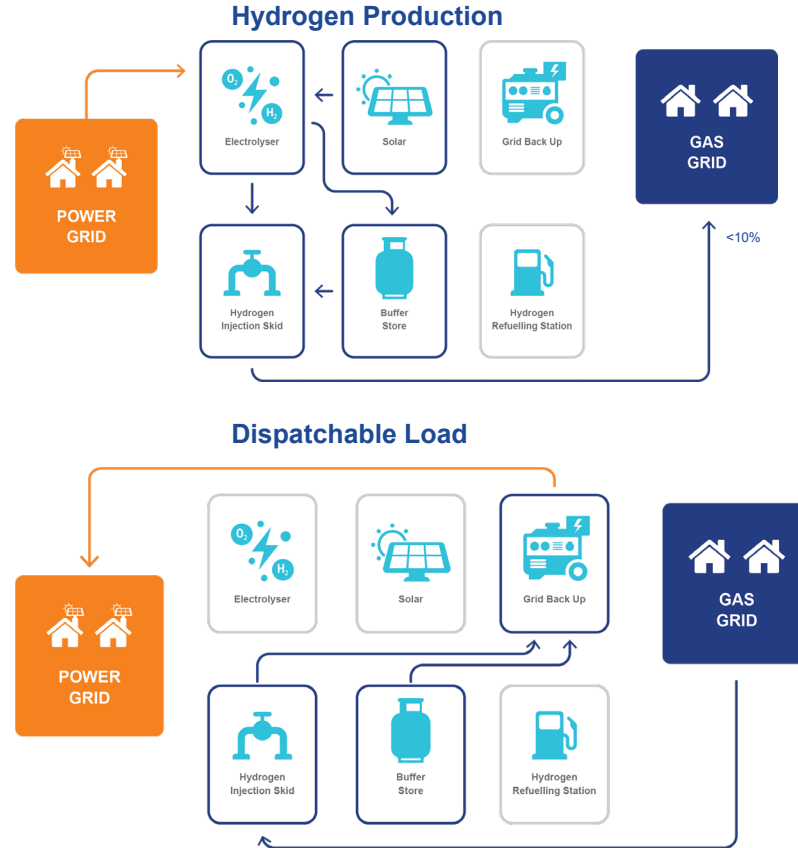
- 18 month design and construction
- Commission late 2020
- 5yr operational trial

## Budget

- 15million (co-funded with ARENA)

## Location

- Western Sydney  
Horsley Park

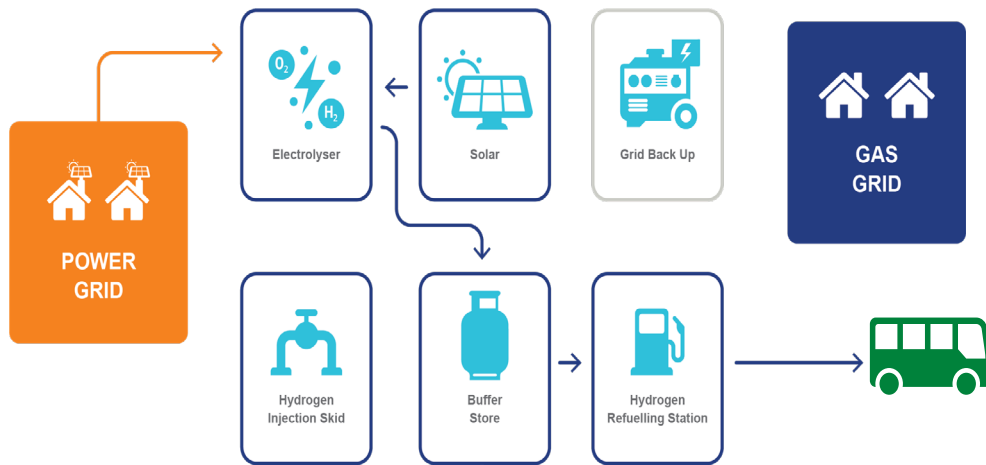


## Project components

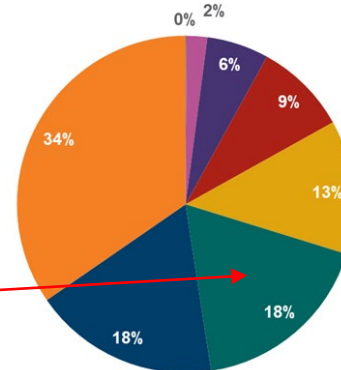
- 500kW Electrolyser
- H<sub>2</sub> grid injection skid
- H<sub>2</sub> test and demonstration facilities
- Onsite Power Generator
- H<sub>2</sub> Buffer Storage
- H<sub>2</sub> Refueler
- Rainwater collection and potable water



# Unlocking Value: Sector Coupling



## Australian Greenhouse Emissions by Industry



- Land use change
- Waste
- Industrial processes
- Fugitive emissions
- Agriculture
- Transport
- Stationary energy
- Electricity

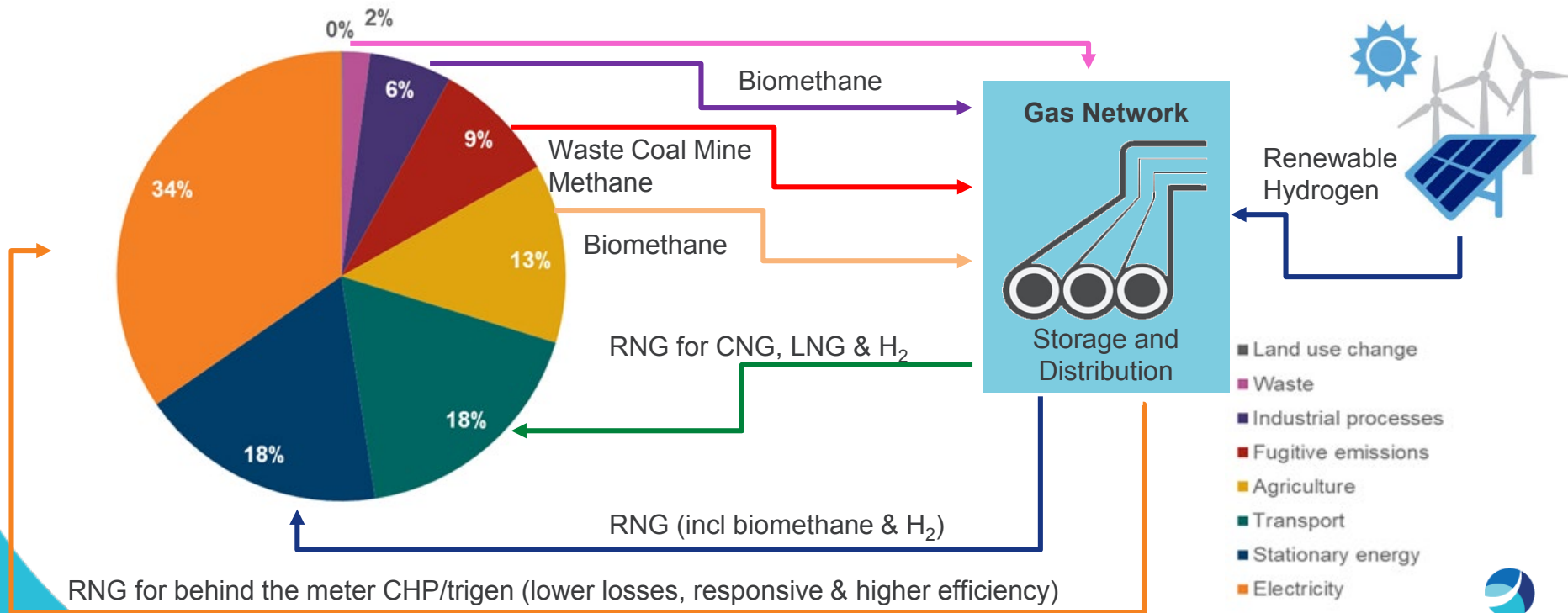
Source: Department of the Environment and Energy, 2017

“Hydrogen offers an opportunity for optimisation of renewable energy use between the electricity, gas and transport sectors (i.e. ‘**sector coupling**’)” <sup>1</sup>

Jemena’s project provides an opportunity to provide zero emission fuel to the transport industry and the transport industry provides an early target market to support scalable hydrogen investment and infrastructure.

# Potential Role of Gas Distribution Networks

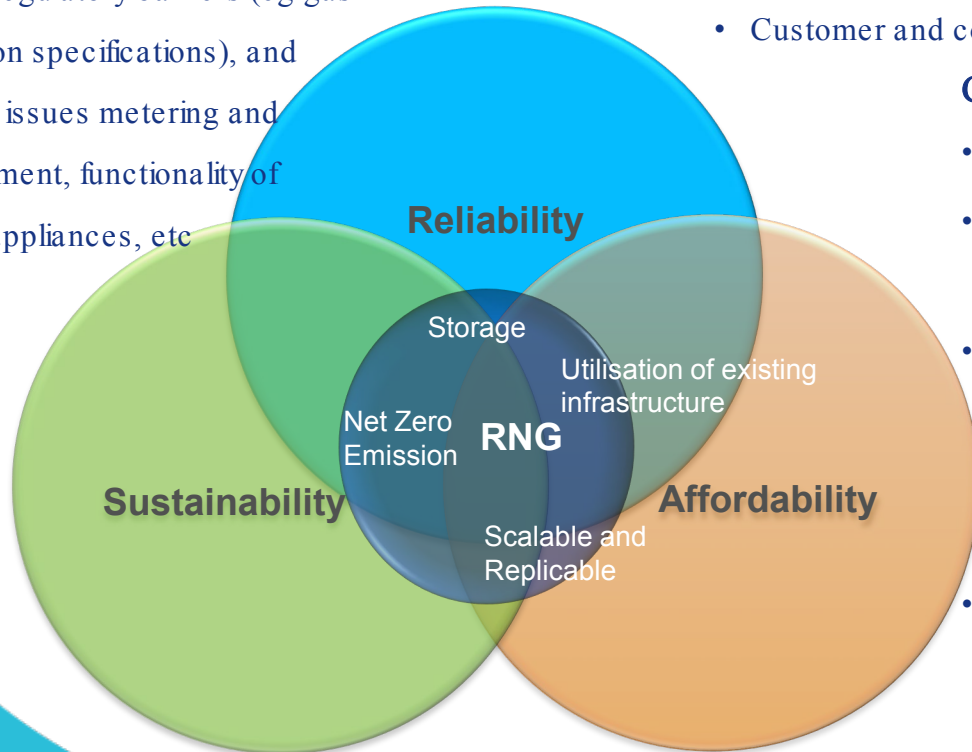
Australian Greenhouse Gas Emission Sources, Department of the Environment and Energy, 2017



# Renewable Natural Gas Next Steps

## Technical and Regulatory

Resolve regulatory barriers (eg gas distribution specifications), and technical issues metering and measurement, functionality of existing appliances, etc



## Social licence



- Industry collaboration (elec, gas, transport)
- Customer and community engagement

## Commercialisation

- Establishing RNG market (certification)
- Evaluate viability of existing technologies (gas spec, scalability and replicability)
- Gas supply agreements (eg CNG for transport, BTM CHP/tri-gen, retail etc) to underpin upstream investment in production and processing for RNG
- Industry targets and industry incentives (regulatory allowance, upstream incentives, RETs, BASIX, NABERS)



# Further Information and Questions

## Further information:

<https://jemena.com.au>

<https://jemena.com.au/about/innovation/>

<https://www.linkedin.com/company/jemena/>